Remarks

The Office Action mailed March 27, 2006 has been carefully reviewed and the following remarks have been made in consequence thereof.

Claims 4, 5, 7-12, 16, 17, 19-21, and 25 are now pending in this application. Claims 4, 5, 7-12, 16, 17, 19-21, and 25 are rejected. Claims 1-3, 6, 13-15, 18, 22-24, and 26 are canceled without prejudice, waiver, or disclaimer. Claims 4, 16, and 25 have been amended. No new matter has been added.

In accordance with 37 C.F.R. 1.136(a), a one-month extension of time is submitted herewith to extend the due date of the response to the Office Action dated March 27, 2006 for the above-identified patent application from June 27, 2006 through and including July 27, 2004. In accordance with 37 C.F.R. 1.17(a)(1), authorization to charge a deposit account in the amount of $120.00 to cover this extension of time request also is submitted herewith.

The rejection of Claims 4, 5, 7, 8, 10-12, 16, 17, 20, 21, and 25 under 35 U.S.C. § 103(a) as being unpatentable over Mattson et al. (U.S. Patent No. 5,229,934) in view of Snyder et al. (U.S. Patent 5,923,775), Labaere et al. (U.S. Patent 5,717,791) and Toth et al. (U.S. Patent 6,115,487), and further in view of Florent et al. (U.S. Patent 5,594,845) is respectfully traversed.

Mattson et al. describe an imaging system including a forward projector means for forward projecting data in an image representation along each of a plurality of rays to form forward projected data sets (column 7, lines 60-64). The imaging system further includes a means for comparing the forward projected data sets with a standard to determine whether each of the forward projected data sets, hence a corresponding data set backprojected along the same ray into an image memory, contains bad data (column 7, line 65 – column 8, line 1).

Snyder et al. describe a gradient estimation system (70) that processes an input image or signal to generate a gradient image (column 3, lines 29-31). The gradient image represents a magnitude of a gradient at each point in the image, independent of direction (column 3, lines 31-33). A threshold segmentation system (80) processes the gradient image to generate a plurality of mask images (column 7, lines 19-21). A

noise measurement system (190) processes the gradient image, the plurality of mask images, and a plurality of scalar thresholds to generate a plurality of signal dependent noise estimates (230, 240, . . . , 250) (column 7, lines 29-32).

Labaere et al. describe a commonly known technique of unsharp masking, adaptive histogram equalisation, and a plurality of variants on these generic methods, that all suffer to some extent from a shortcoming that ghost details, called artifacts are created in a vicinity of significant signal level transitions, which occur, for example, at bone/soft tissue boundaries within an image (column 1, lines 60-67).

Toth et al. describe an algorithm in which a ratio of images (BWEQ and WEQ) is evaluated, and a region of interest extracted by multiplying the ratio by a function II(r), to obtain a calibration pattern (CP) (column 2, lines 5-7). By subtracting 1.0 from the ratio, and multiplying by a CT number scale factor (ctscale) and an apodizing window (Aw(r)), a calibration error vector (CEV) is obtained that is representative of a circularly symmetric image error introduced by a non-corrected bone-induced artifact (column 2, lines 13-18). In the algorithm, a combination of various rows of a detector via helical scanning is performed (column 2, lines 42-46).

Florent et al. describe a means of an image processing method that includes a determination of a common view point for a source image and a target image, and of an orthonormal reference frame having a view point (P) as an origin, and a measurement of a tilting angle, a panning angle, and a scale factor (d) of the target image in the reference frame (column 2, lines 43-46).

Claim 4 recites a method for facilitating reconstruction of an image, the method comprising "estimating a gradient for at least one high-density object; generating a gradient image using the estimated gradient wherein the gradient image represents a variation of the high density object in *z*; generating an error-candidate projection using the gradient image, wherein to generate the error-candidate projection, said method further comprises forward projecting the gradient image along β wherein β represents a projection view angle; and scaling the error-candidate projection with an error fraction c_β, wherein $c_\beta = z - int(z)$, where

$z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$, wherein β_c represents a center view angle, p is the pitch,

int(z) represents the integer portion of z, and M represents the number of rows in a detector array."

None of Mattson et al., Snyder et al., Labaere et al., Toth et al., or Florent et al., considered alone or in combination, describe or suggest a method for facilitating reconstruction of an image as recited in Claim 4. Specifically, none of Mattson et al., Snyder et al., Labaere et al., Toth et al., or Florent et al., considered alone or in combination, describe or suggest scaling the error-candidate projection with an error fraction c_β, where $c_\beta = z - int(z)$, where $z = \frac{(\beta-\beta_c)p}{2\pi} + \frac{M+1}{2}$, where β_c represents a center view angle, p is the pitch, int(z) represents the integer portion of z, and M represents the number of rows in a detector array. Rather, Mattson et al. describe a forward projector means for forward projecting data in an image representation along each of a plurality of rays to form forward projected data sets and a means for comparing the forward projected data sets with a standard to determine whether each of the forward projected data sets, hence a corresponding data set backprojected along the same ray into an image memory, contains bad data. A description of the forward projector means and the means for comparing does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta-\beta_c)p}{2\pi} + \frac{M+1}{2}$ Synder et al. describe a gradient estimation system that processes an input image to generate a gradient image and a noise measurement system processes the gradient image, a plurality of mask images, and a plurality of scalar thresholds to generate a plurality of signal dependent noise estimates. A description of the gradient estimation system and the noise measurement system does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta-\beta_c)p}{2\pi} + \frac{M+1}{2}$

Moreover, Labaere et al. describe a commonly known technique of unsharp masking, adaptive histogram equalisation, and a plurality of variants on these generic methods, that all suffer to some extent from a shortcoming that artifacts are created in a vicinity of significant signal level transitions. A description of the artifacts does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta-\beta_c)p}{2\pi} + \frac{M+1}{2}$ Toth et al. describe an algorithm for evaluating a ratio of images, and for extracting a region of interest by multiplying

the ratio by a function II(r). By subtracting 1.0 from the ratio, and multiplying by a CT number scale factor and an apodizing window, a calibration error vector is obtained that is representative of a circularly symmetric image error introduced by a non-corrected bone-induced artifact. Moreover, in the algorithm, a combination of various rows of a detector via helical scanning is performed. A description of the evaluation of the ratio, extraction of the region, subtraction of 1 from the ratio, the helical weighting, and the multiplication as described in Toth et al. does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$ Moreover, a description of the CT number scale factor and the helical weighting does not teach the center view angle β_c. Florent et al. describe a means of an image processing method that includes making a determination of a common view point for a source image and a target image, and of an orthonormal reference frame having a view point as an origin. The image processing method further includes performing a measurement of a tilting angle, a panning angle, and a scale factor of the target image in the reference frame. A description of the measurement of the tilting angle, the panning angle, and the scale factor does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$. Moreover, a description of the scale factor does not teach the M that represents the number of rows in a detector array. Accordingly, none of Mattson et al., Snyder et al., Labaere et al., Toth et al., or Florent et al., considered alone or in combination, describe or suggest scaling the error-candidate projection with an error fraction c_β, where $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$, where β_c represents a center view angle, p is the pitch, int(z) represents the integer portion of z, and M represents the number of rows in a detector array. For the reasons set forth above, Claim 4 is submitted to be patentable over Mattson et al. in view of Snyder et al., Labaere et al. and Toth et al., and further in view of Florent et al.

Claims 5, 7, 8, 10-12 depend, directly or indirectly, from independent Claim 4. When the recitations of Claims 5, 7, 8, 10-12 are considered in combination with the recitations of Claim 4, Applicant submits that dependent Claims 5, 7, 8, 10-12 likewise are patentable over Mattson et al. in view of Snyder et al., Labaere et al. and Toth et al., and further in view of Florent et al.

Claim 16 recites a computer programmed to "estimate a gradient for at least one high-density object; generate a gradient image using the estimated gradient wherein the gradient image represents a variation of the high density object in z; generate an error-candidate projection using the gradient image; forward project the gradient image along β wherein β represents a projection view angle; and scale the error-candidate projection with an error fraction c_β, wherein $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$, wherein β_c represents a center view angle, p is the pitch, int(z) represents the integer portion of z, and M represents the number of rows in a detector array."

None of Mattson et al., Snyder et al., Labaere et al., Toth et al., or Florent et al., considered alone or in combination, describe or suggest a computer as recited in Claim 16. Specifically, none of Mattson et al., Snyder et al., Labaere et al., Toth et al., or Florent et al., considered alone or in combination, describe or suggest a computer programmed to scale the error-candidate projection with an error fraction c_β, where $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$, where β_c represents a center view angle, p is the pitch, int(z) represents the integer portion of z, and M represents the number of rows in a detector array. Rather, Mattson et al. describe a forward projector means for forward projecting data in an image representation along each of a plurality of rays to form forward projected data sets and a means for comparing the forward projected data sets with a standard to determine whether each of the forward projected data sets, hence a corresponding data set backprojected along the same ray into an image memory, contains bad data. A description of the forward projector means and the means for comparing does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$ Synder et al. describe a gradient estimation system that processes an input image to generate a gradient image and a noise measurement system processes the gradient image, a plurality of mask images, and a plurality of scalar thresholds to generate a plurality of signal dependent noise estimates. A description of the gradient estimation system and the noise measurement system does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$

Moreover, Labaere et al. describe a commonly known technique of unsharp masking, adaptive histogram equalisation, and a plurality of variants on these generic methods, that all suffer to some extent from a shortcoming that artifacts are created in a vicinity of significant signal level transitions. A description of the artifacts does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$ Toth et al. describe an algorithm for evaluating a ratio of images, and for extracting a region of interest by multiplying the ratio by a function II(r). By subtracting 1.0 from the ratio, and multiplying by a CT number scale factor and an apodizing window, a calibration error vector is obtained that is representative of a circularly symmetric image error introduced by a non-corrected bone-induced artifact. Moreover, in the algorithm, a combination of various rows of a detector via helical scanning is performed. A description of the evaluation of the ratio, extraction of the region, subtraction of 1 from the ratio, the helical weighting, and the multiplication as described in Toth et al. does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$ Moreover, a description of the CT number scale factor and the helical weighting does not teach the center view angle β_c. Florent et al. describe a means of an image processing method that includes making a determination of a common view point for a source image and a target image, and of an orthonormal reference frame having a view point as an origin. The image processing method further includes performing a measurement of a tilting angle, a panning angle, and a scale factor of the target image in the reference frame. A description of the measurement of the tilting angle, the panning angle, and the scale factor does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$. Moreover, a description of the scale factor does not teach the M that represents the number of rows in a detector array. Accordingly, none of Mattson et al., Snyder et al., Labaere et al., Toth et al., or Florent et al., considered alone or in combination, describe or suggest a computer programmed to scale the error-candidate projection with an error fraction c_β, where $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$, where β_c represents a center view angle, p is the pitch, int(z) represents the integer portion of z, and M represents the number of rows in a detector array. For the reasons set forth above, Claim 16 is

submitted to be patentable over Mattson et al. in view of Snyder et al., Labaere et al. and Toth et al., and further in view of Florent et al.

Claims 17, 20, and 21 depend from independent Claim 16. When the recitations of Claims 17, 20, and 21 are considered in combination with the recitations of Claim 16, Applicant submits that dependent Claims 17, 20, and 21 likewise are patentable over Mattson et al. in view of Snyder et al., Labaere et al. and Toth et al., and further in view of Florent et al.

Claim 25 recites a computed tomographic (CT) imaging system for reconstructing an image of an object, the imaging system comprising "a detector array; at least one radiation source; and a computer coupled to said detector array and said radiation source, said computer configured to: estimate a gradient for at least one high-density object; generate a gradient image using the estimated gradient wherein the gradient image represents a variation of the high density object in *z*; generate an error-candidate projection using the gradient image; and scale the error-candidate projection with an error fraction c_β, wherein $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$, wherein β_c represents a center view angle, p is the pitch, int(z) represents the integer portion of z, and M represents the number of rows in a detector array."

None of Mattson et al., Snyder et al., Labaere et al., Toth et al., or Florent et al., considered alone or in combination, describe or suggest a computed tomographic (CT) imaging system as recited in Claim 25. Specifically, none of Mattson et al., Snyder et al., Labaere et al., Toth et al., or Florent et al., considered alone or in combination, describe or suggest the computer configured to scale the error-candidate projection with an error fraction c_β, where $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$, where β_c represents a center view angle, p is the pitch, int(z) represents the integer portion of z, and M represents the number of rows in a detector array. Rather, Mattson et al. describe a forward projector means for forward projecting data in an image representation along each of a plurality of rays to form forward projected data sets and a means for comparing the forward projected data sets

with a standard to determine whether each of the forward projected data sets, hence a corresponding data set backprojected along the same ray into an image memory, contains bad data. A description of the forward projector means and the means for comparing does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$ Synder et al. describe a gradient estimation system that processes an input image to generate a gradient image and a noise measurement system processes the gradient image, a plurality of mask images, and a plurality of scalar thresholds to generate a plurality of signal dependent noise estimates. A description of the gradient estimation system and the noise measurement system does not teach $c_\beta = z - int(z)$, where

$$z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}.$$

Moreover, Labaere et al. describe a commonly known technique of unsharp masking, adaptive histogram equalisation, and a plurality of variants on these generic methods, that all suffer to some extent from a shortcoming that artifacts are created in a vicinity of significant signal level transitions. A description of the artifacts does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$ Toth et al. describe an algorithm for evaluating a ratio of images, and for extracting a region of interest by multiplying the ratio by a function II(r). By subtracting 1.0 from the ratio, and multiplying by a CT number scale factor and an apodizing window, a calibration error vector is obtained that is representative of a circularly symmetric image error introduced by a non-corrected bone-induced artifact. Moreover, in the algorithm, a combination of various rows of a detector via helical scanning is performed. A description of the evaluation of the ratio, extraction of the region, subtraction of 1 from the ratio, the helical weighting, and the multiplication as described in Toth et al. does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$ Moreover, a description of the CT number scale factor and the helical weighting does not teach the center view angle β_c. Florent et al. describe a means of an image processing method that includes making a determination of a common view point for a source image and a target image, and of an orthonormal reference frame having a view point as an origin. The image processing method further includes performing a measurement of a tilting angle, a

panning angle, and a scale factor of the target image in the reference frame. A description of the measurement of the tilting angle, the panning angle, and the scale factor does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$. Moreover, a description of the scale factor does not teach the M that represents the number of rows in a detector array. Accordingly, none of Mattson et al., Snyder et al., Labaere et al., Toth et al., or Florent et al., considered alone or in combination, describe or suggest the computer configured to scale the error-candidate projection with an error fraction c_β, where $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$, where β_c represents a center view angle, p is the pitch, int(z) represents the integer portion of z, and M represents the number of rows in a detector array. For the reasons set forth above, Claim 25 is submitted to be patentable over Mattson et al. in view of Snyder et al., Labaere et al. and Toth et al., and further in view of Florent et al.

For at least the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claims 4, 5, 7, 8, 10-12, 16, 17, 20, 21, and 25 be withdrawn.

The rejection of Claims 9 and 19 under 35 U.S.C. § 103(a) as being unpatentable over Mattson et al. in view of Snyder et al., Labaere et al., Toth et al., Florent et al., and further in view of Moore (U.S. Patent 4,222,104) is respectfully traversed.

Mattson et al., Snyder et al., Labaere et al., Toth et al., and Florent et al. are described above. Moore describes a computed tomography system and method. In the computed tomography method, a plurality of modified and interpolated signals are back projected along a plurality of parallel paths into a matrix (column 4, lines 11-13). For a second pass, the modified and interpolated signals are forward projected along parallel paths, corrected and once more back projected along the parallel paths (column 4, lines 13-15).

Claim 9 depends from independent Claim 4 which is recited above.

None of Mattson et al., Snyder et al., Labaere et al., Toth et al., Florent et al., or Moore, considered alone or in combination, describe or suggest a method for facilitating reconstruction of an image as recited in Claim 4. Specifically, none of

Mattson et al., Snyder et al., Labaere et al., Toth et al., Florent et al., or Moore, considered alone or in combination, describe or suggest scaling the error-candidate projection with an error fraction c_β, where $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$, where β_c represents a center view angle, p is the pitch, int(z) represents the integer portion of z, and M represents the number of rows in a detector array. Rather, Mattson et al. describe a forward projector means for forward projecting data in an image representation along each of a plurality of rays to form forward projected data sets and a means for comparing the forward projected data sets with a standard to determine whether each of the forward projected data sets, hence a corresponding data set backprojected along the same ray into an image memory, contains bad data. A description of the forward projector means and the means for comparing does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$ Synder et al. describe a gradient estimation system that processes an input image to generate a gradient image and a noise measurement system processes the gradient image, a plurality of mask images, and a plurality of scalar thresholds to generate a plurality of signal dependent noise estimates. A description of the gradient estimation system and the noise measurement system does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$

Moreover, Labaere et al. describe a commonly known technique of unsharp masking, adaptive histogram equalisation, and a plurality of variants on these generic methods, that all suffer to some extent from a shortcoming that artifacts are created in a vicinity of significant signal level transitions. A description of the artifacts does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$ Toth et al. describe an algorithm for evaluating a ratio of images, and for extracting a region of interest by multiplying the ratio by a function II(r). By subtracting 1.0 from the ratio, and multiplying by a CT number scale factor and an apodizing window, a calibration error vector is obtained that is representative of a circularly symmetric image error introduced by a non-corrected bone-induced artifact. Moreover, in the algorithm, a combination of various rows of a detector via helical scanning is performed. A description of the

evaluation of the ratio, extraction of the region, subtraction of 1 from the ratio, the helical weighting, and the multiplication as described in Toth et al. does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$ Moreover, a description of the CT number scale factor and the helical weighting does not teach the center view angle β_c.

Furthermore, Florent et al. describe a means of an image processing method that includes making a determination of a common view point for a source image and a target image, and of an orthonormal reference frame having a view point as an origin. The image processing method further includes performing a measurement of a tilting angle, a panning angle, and a scale factor of the target image in the reference frame. A description of the measurement of the tilting angle, the panning angle, and the scale factor does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$. Moreover, a description of the scale factor does not teach the M that represents the number of rows in a detector array. Moore describes forward projection and backprojection. A description of the back and the forward projection does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$. Accordingly, none of Mattson et al., Snyder et al., Labaere et al., Toth et al., Florent et al., or Moore, considered alone or in combination, describe or suggest scaling the error-candidate projection with an error fraction c_β, where $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$, where β_c represents a center view angle, p is the pitch, int(z) represents the integer portion of z, and M represents the number of rows in a detector array. For the reasons set forth above, Claim 4 is submitted to be patentable over Mattson et al. in view of Snyder et al., Labaere et al., Toth et al., Florent et al., and further in view of Moore.

When the recitations of Claim 9 are considered in combination with the recitations of Claim 4, Applicant submits that dependent Claim 9 likewise is patentable over Mattson et al. in view of Snyder et al., Labaere et al., Toth et al., Florent et al., and further in view of Moore.

Claim 19 depends indirectly from Claim 16 which is recited above.

None of Mattson et al., Snyder et al., Labaere et al., Toth et al., Florent et al., or Moore, considered alone or in combination, describe or suggest a computer as recited in Claim 16. Specifically, none of none of Mattson et al., Snyder et al., Labaere et al., Toth et al., Florent et al., or Moore, considered alone or in combination, describe or suggest a computer programmed to scale the error-candidate projection with an error fraction c_β, where $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$, where β_c represents a center view angle, p is the pitch, int(z) represents the integer portion of z, and M represents the number of rows in a detector array. Rather, Mattson et al. describe a forward projector means for forward projecting data in an image representation along each of a plurality of rays to form forward projected data sets and a means for comparing the forward projected data sets with a standard to determine whether each of the forward projected data sets, hence a corresponding data set backprojected along the same ray into an image memory, contains bad data. A description of the forward projector means and the means for comparing does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$ Synder et al. describe a gradient estimation system that processes an input image to generate a gradient image and a noise measurement system processes the gradient image, a plurality of mask images, and a plurality of scalar thresholds to generate a plurality of signal dependent noise estimates. A description of the gradient estimation system and the noise measurement system does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$

Moreover, Labaere et al. describe a commonly known technique of unsharp masking, adaptive histogram equalisation, and a plurality of variants on these generic methods, that all suffer to some extent from a shortcoming that artifacts are created in a vicinity of significant signal level transitions. A description of the artifacts does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$ Toth et al. describe an algorithm for evaluating a ratio of images, and for extracting a region of interest by multiplying the ratio by a function II(r). By subtracting 1.0 from the ratio, and multiplying by a CT number scale factor and an apodizing window, a calibration error vector is

obtained that is representative of a circularly symmetric image error introduced by a non-corrected bone-induced artifact. Moreover, in the algorithm, a combination of various rows of a detector via helical scanning is performed. A description of the evaluation of the ratio, extraction of the region, subtraction of 1 from the ratio, the helical weighting, and the multiplication as described in Toth et al. does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$ Moreover, a description of the CT number scale factor and the helical weighting does not teach the center view angle β_c. Florent et al. describe a means of an image processing method that includes making a determination of a common view point for a source image and a target image, and of an orthonormal reference frame having a view point as an origin. The image processing method further includes performing a measurement of a tilting angle, a panning angle, and a scale factor of the target image in the reference frame. A description of the measurement of the tilting angle, the panning angle, and the scale factor does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$. Moreover, a description of the scale factor does not teach the M that represents the number of rows in a detector array. Moore describes forward projection and backprojection. A description of the back and the forward projection does not teach $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$. Accordingly, none of Mattson et al., Snyder et al., Labaere et al., Toth et al., Florent et al., or Moore, considered alone or in combination, describe or suggest a computer programmed to scale the error-candidate projection with an error fraction c_β, where $c_\beta = z - int(z)$, where $z = \frac{(\beta - \beta_c)p}{2\pi} + \frac{M+1}{2}$, where β_c represents a center view angle, p is the pitch, int(z) represents the integer portion of z, and M represents the number of rows in a detector array. For the reasons set forth above, Claim 16 is submitted to be patentable over Mattson et al. in view of Snyder et al., Labaere et al., Toth et al., Florent et al., and further in view of Moore.

When the recitations of Claim 19 are considered in combination with the recitations of Claim 16, Applicant submits that dependent Claim 19 likewise is

patentable over Mattson et al. in view of Snyder et al., Labaere et al., Toth et al., Florent et al., and further in view of Moore.

For at least the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claims 9 and 19 be withdrawn.

Moreover, Applicant respectfully submits that the Section 103 rejections of Claims 4, 5, 7-12, 16, 17, 19, 20, 21, and 25 are not proper rejections. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. None of Mattson et al., Snyder et al., Labaere et al., Toth et al., Florent et al., or Moore, considered alone or in combination, describe or suggest the claimed combination. Furthermore, in contrast to the assertion within the Office Action, Applicant respectfully submits that it would not be obvious to one skilled in the art to combine Mattson et al. with Snyder et al., Labaere et al., Toth et al., Florent et al., or Moore, because there is no motivation to combine the references suggested in the cited art itself.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicant's disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion or motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of

ordinary skill in the art. The present Section 103 rejections are based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Mattson et al. teach a forward projector means for forward projecting data in an image representation along each of a plurality of rays to form forward projected data sets and a means for comparing the forward projected data sets with a standard to determine whether each of the forward projected data sets, hence a corresponding data set backprojected along the same ray into an image memory, contains bad data. Synder et al. teach a gradient estimation system that processes an input image to generate a gradient image and a noise measurement system processes the gradient image, a plurality of mask images, and a plurality of scalar thresholds to generate a plurality of signal dependent noise estimates. Labaere et al. teach a commonly known technique of unsharp masking, adaptive histogram equalisation, and a plurality of variants on these generic methods, that all suffer to some extent from a shortcoming that artifacts are created in a vicinity of significant signal level transitions.

Moreover, Toth et al. describe an algorithm for evaluating a ratio of images, and for extracting a region of interest by multiplying the ratio by a function II(r). By subtracting 1.0 from the ratio, and multiplying by a CT number scale factor and an apodizing window, a calibration error vector is obtained that is representative of a circularly symmetric image error introduced by a non-corrected bone-induced artifact. Moreover, in the algorithm, a combination of various rows of a detector via helical scanning is performed. Florent et al. describe a means of an image processing method that includes making a determination of a common view point for a source image and a target image, and of an orthonormal reference frame having a view point as an origin. The image processing method further includes performing a measurement of a tilting angle, a panning angle, and a scale factor of the target image in the reference frame. Moore describes forward projection and backprojection. Since there is no teaching nor suggestion in the cited art for the combination, the Section 103 rejections appear to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicant requests that the Section 103 rejections of Claims 4, 5, 7-12, 16, 17, 19, 20, 21, and 25 be withdrawn.

For at least the reasons set forth above, Applicant respectfully requests that the rejections of Claims 4, 5, 7-12, 16, 17, 19, 20, 21, and 25 under 35 U.S.C. 103(a) be withdrawn.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

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